



## Lake Wakatipu flood hazard | KINGSTON

**Kingston has a history of flooding.** This is a natural process resulting from extended periods of heavy rain and snowmelt. North-westerly fronts moving over the southern part of the South Island can cause heavy rainfall in the headwaters of Lake Wakatipu, especially if they 'stall' and hover over the Southern Alps for days at a time.

It will generally take a series of such fronts to raise lake levels enough to cause flooding. Several large rivers flow into the lake while only one (the Kawarau River) flows out. Flooding can occur when more water flows into the lake than can flow out, and when there is insufficient time for levels to drop between heavy rainfall events.

The Otago Regional Council (ORC) works with the Queenstown Lakes District Council (QLDC) to provide flood warning and information services. These are intended to help people prepare for, and respond to a flood.



Breaking waves and debris can cause additional damage within low-lying parts of Kingston, if strong onshore winds coincide with high lake levels.

Residents should be aware of strong winds whipping up when the lake is high.

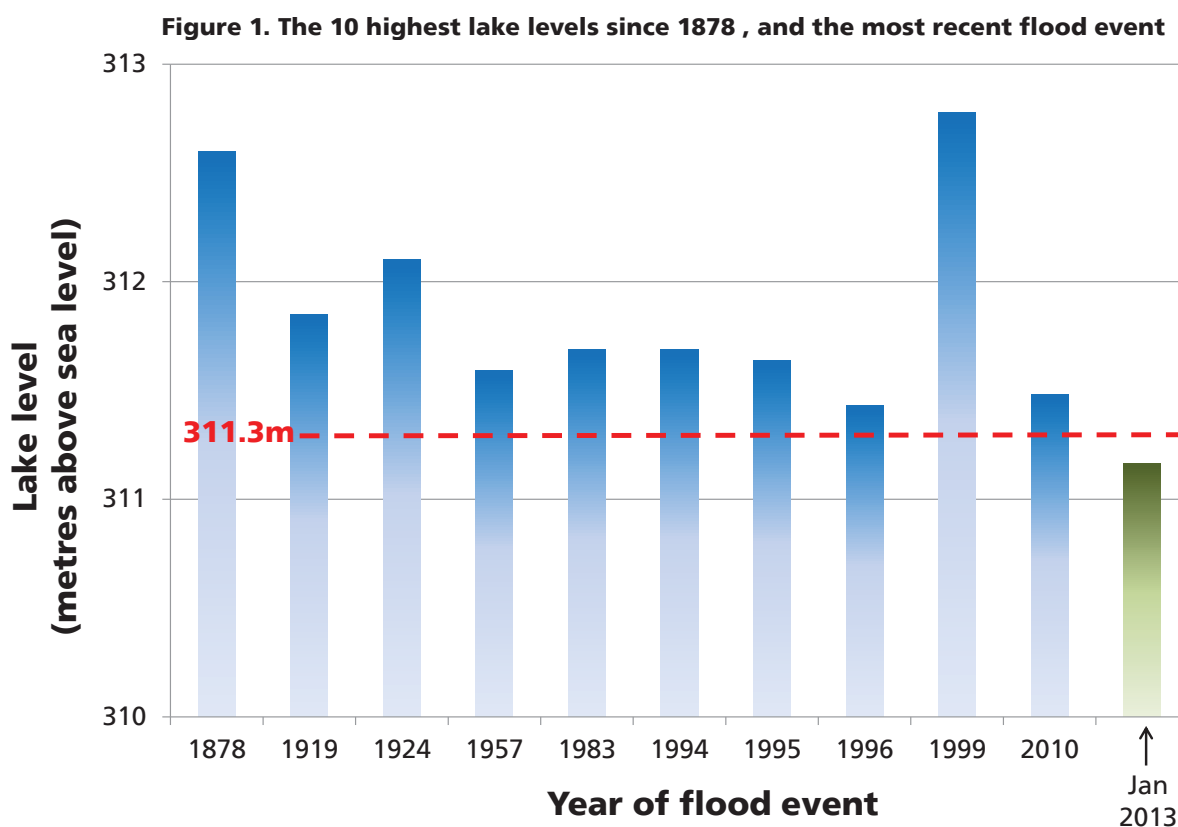
# Characteristics of flood events

## How quickly do floods occur?

Every event is different, and their severity will depend on the duration, extent, and intensity of rainfall across the entire catchment. Lake Wakatipu generally takes at least two days to rise to a level where flooding begins to occur after heavy rainfall. The lake can rise faster if the highest inflows coincide with a large flood peak in the Shotover River. This limits the outflow from the lake until the Shotover River recedes.

## How often do floods occur?

Although major floods have been few and far between during the past 10 years, there were several large floods involving the lake in the 1990's. Figure 1 shows that the most significant floods on record occurred in 1878 and 1999.



## When do floods start to affect Kingston?

Lake Wakatipu begins to inundate lower-lying parts of Kingston at a level of 311.3m. This has happened on 20 separate occasions since 1878. There's a 13 percent chance of the lake exceeding this level in any year. There's a 75 percent chance that the lake will exceed this level at least once during any 10-year period.

## How long do floods last?

A series of fronts bringing heavy rain to the headwater catchments can result in the lake staying high for a long time. The lake peaked at almost 311.5m in April 2010, and was above 311.3m for five days. Lake Wakatipu peaked at 312.78m in November 1999 and was above 311.3m for two weeks.

**Figure 2. Depth of flooding at Kingston at a water level of 312.78m**



### What about the effect of the new Shotover Delta training line?

Sediment and water flows from the Shotover River can restrict flows in the Kawarau River, particularly during flooding when the Shotover River is high. This can extend how long the lake is at a high level.

Recent works on the Shotover Delta have been designed to prevent this restriction from becoming any worse. These include targeted gravel extraction to maintain a more efficient channel, and construction of a training line (an engineered rock wall) which 'guides' the river at the junction of the Shotover and Kawarau Rivers.

These works will not eliminate flood risk for Lake Wakatipu communities, but aim to ensure that it does not become any worse.

### Summary

Because it may take a few days for the lake to reach flood levels, lakeside communities will normally have time to respond.

However, the ability to respond and to recover quickly depends on people being prepared in advance. Check with the QLDC on the best way to prepare for the effects of flooding. The ORC's Water Info service is also a useful source of information when flooding in Lake Wakatipu is possible (see back page).

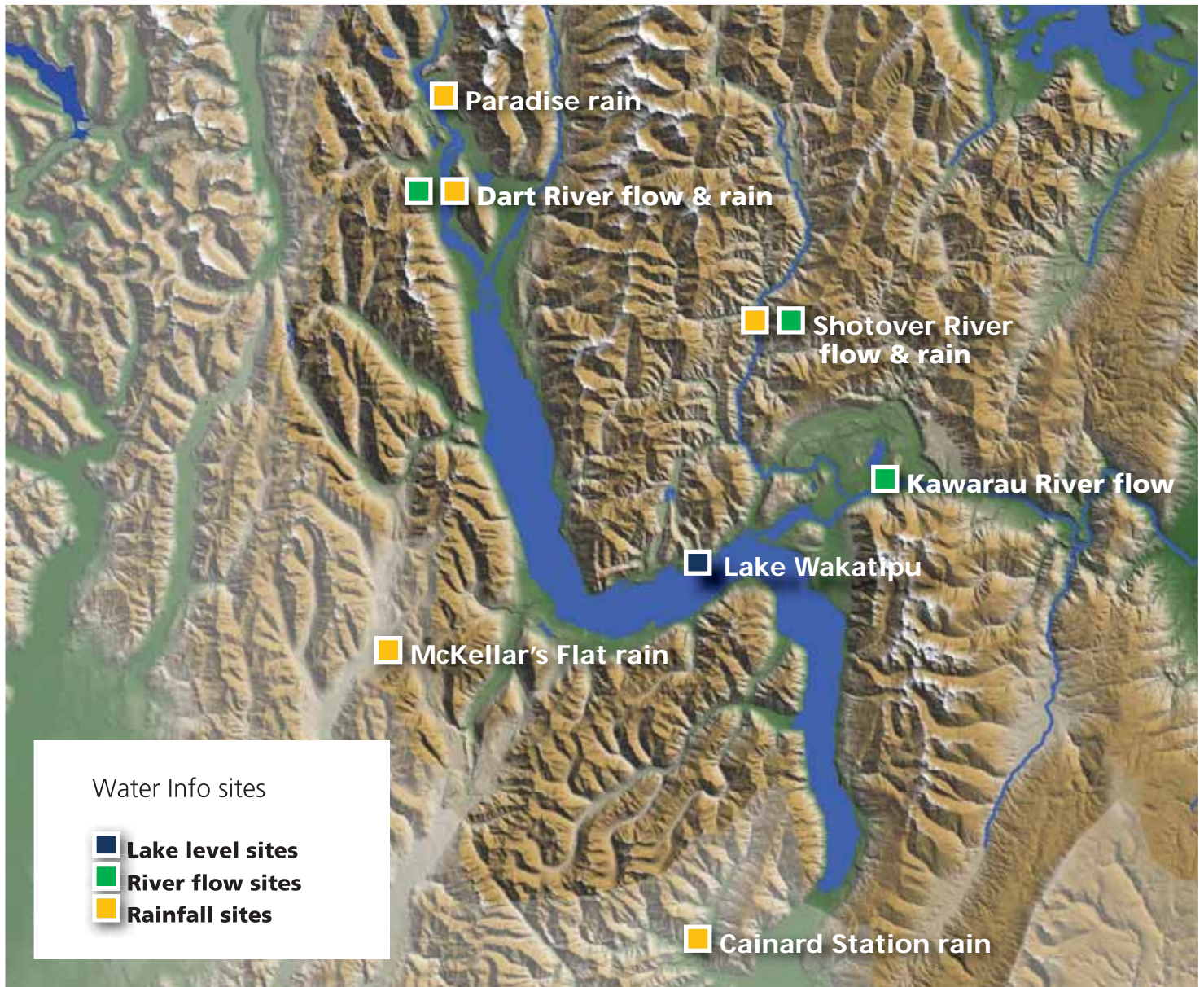
Remember that it can be a week or more before Lake Wakatipu drops back below flood levels.



# Stay informed

Detailed flood and hazard information can be accessed under the quick links section at [www.orc.govt.nz](http://www.orc.govt.nz)

- Using the ORC's WaterInfo service gives you the most recent river, lake and rainfall information for the Lake Wakatipu catchment. Information is updated hourly during floods. To receive alerts about flood events straight to your cellphone subscribe to ORC's flood alert service (see website on how to do this).
- For more information on a range of natural hazards in the Otago region check out the ORC's Natural Hazards Database.



ORC also uses weather and rainfall forecasts to predict when Lake Wakatipu is likely to peak, what level it's likely to reach, and how long it is expected to remain above flood levels.

These predictions are supplied to the media, and are also available through the ORC and QLDC websites [www.orc.govt.nz](http://www.orc.govt.nz) and [www.qldc.govt.nz](http://www.qldc.govt.nz)



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